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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,484	03/20/2002	Osamu Sakai	43888-132	7151

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EXAMINER

YUAN, DAH WEI D

ART UNIT PAPER NUMBER

1745

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/088,484

Applicant(s)SAKAI ET AL. **Examiner**

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1745

POLYMER ELECTROLYTE FUEL CELL AND METHOD
FOR PRODUCING THE SAME

Examiner: Yuan S.N. 10/088,484 Art Unit: 1745 March 1, 2004

Detailed Action

1. The Applicant's amendment filed on January 27, 2004 was received. Claim 3 was cancelled. Claims 1,5 were amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on October 27, 2004.

Claim Rejections - 35 USC § 112

3. The claim rejections under 35 U.S.C. 112, second paragraph, on claim 5 are withdrawn, because the claim has been amended.

Claim Rejections - 35 USC § 102

4. Claims 1-2,8-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Tomoyuki et al. (JP 09-245802).

With respect to claim1, Tomoyuki et al. teach a polymer electrolyte fuel cell comprising an ion conductive polymer electrolyte membrane (1), an anode (4A), a cathode (4C), an anode side electroconductive separator having a gas channel (5A), and a cathode side electroconductive separator (5C). Both the anode and cathode comprise a gas diffusion layer (13) and a catalyst layer (12), which is in contact with the membrane (11). See Figures 1 and 2. Tomoyuki et al.

teach both the gas permeability and proton conductivity of the electrode vary in the thickness direction of the electrode by changing the ion exchange resin concentration, catalyst concentration, and the specific surface area of the catalyst support.

With respect to claim 2, Tomoyuki et al. further teach the content of Nafion (a hydrogen ion exchange polymer electrolyte) is higher at the catalyst layer/membrane interface than that at the gas diffusion layer/catalyst layer interface. See Abstract, Paragraphs 3,5,6,10,12,14,15.

It is noted that claims 8-11 are product-by-process claims. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 103

5. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomoyuki et al. (JP 09-245802) as applied to claims 1-2,8-11 and further in view of Tomoyuki et al. (JP 09-245801).

With respect to claims 4,5, Tomoyuki et al. teach a polymer electrolyte fuel cell as described above in Paragraph 4. However, Tomoyuki et al. do not teach the catalyst layer comprising a layer, which is not in contact with the hydrogen ion conductive polymer electrolyte membrane. Tomoyuki et al. (JP 09-245801) teach a polymer electrolyte fuel cell comprising an

Art Unit: 1745

anode and a cathode. Both electrodes (5) comprise a gas diffusion layer (1), a catalyst layer (2) and an interlayer (4), which is not in contact with the membrane. See Figure 1. The interlayer is used to separate the catalyst layer and the gas diffusion layer so that catalyst cannot advance into the gas diffusion layer. See Paragraph 7. Therefore, it would have been obvious to one of ordinary skill in the art to use the electrode having an interlayer on the polymer electrolyte fuel cell of Tomoyuki (JP 09-245802), because Tomoyuki (JP 09-245801) teaches the use of an interlayer can prevent the interaction between the catalyst layer and the gas diffusion layer in the fuel cell system.

With respect to claims 6,7, Tomoyuki (JP 09-2458010) teach the use of two or more sheets of different porosity to prepare the gas diffusion layer. As a result, the porosity is low toward the catalyst layer. See Claim 4, Paragraph 11.

Response to Arguments

6. Applicant's arguments filed on January 27, 2004 have been fully considered but they are not persuasive.

Applicant's principle arguments are

The catalyst layer has a higher concentration of hydrogen ion conductive polymer near the catalyst layer/polymer electrolyte membrane interface, which is not disclosed in the Tomoyuki reference.

In response to Applicant's arguments, please consider the following comments.

Tomoyuki et al. (JP 9-245802) teach a catalyst layer (12) comprising at least three layers of carbon support. The carbon support is made of platinum and different amounts of Nafion (a hydrogen ion conductive polymer electrolyte). The underlying gas diffusion layer is first applied with a carbon support comprising 38.5% Nafion, followed by a carbon support comprising 50% Nafion and finally by a carbon support comprising 58.5% Nafion. The carbon support layers are individually calcinated and collectively form an electrode laminate, which is to be interfaced with a polymer electrolyte membrane. See Paragraphs 12,15.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 1745

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
March 1, 2004

A handwritten signature in black ink, appearing to read 'Dah-Wei D. Yuan', with a stylized flourish at the end.